

spinal cord of various Vertebrata, and he thinks that J. Gerlach's older important discoveries are in this way confirmed and extended, and that they may be admitted for all bilateral animals. Although I cannot quite agree with this as regards Gerlach's descriptions, it may nevertheless be assumed that here all turns upon the condition which, as I have above indicated, at any rate in its main features, occurs throughout the whole animal kingdom, in which, generally, a more developed nervous system is present. To discuss this matter in its minute details and to clear up the many doubtful points will be an affair of the future.

XXIV.—On the Genus *Hindia* and its Species.

By Prof. P. MARTIN DUNCAN, M.B. (Lond.), F.R.S., &c.

DR. H. RAUFF has been so kind as to send me a copy of his paper "Ueber die Gattung *Hindia*, Dunc." (Separat-Abdruck aus den Sitzungsber. der niederrh. Gesellschaft zu Bonn, Mai 10, 1886). He has confirmed the truth of the diagnosis which I gave of the very beautiful species, and he admits the genus as correct. Dr. Rauff does more than this; he utterly demolishes Prof. Steinmann, who with "grosser Entschiedenheit" wrote that the *Hindia* was not a sponge and had neither oscule, canals, nor spicules! It is very pleasant to have one's battles fought by an able foreign naturalist, and Dr. Rauff has my sincere thanks.

The description of *Hindia* as a genus and of its species, *H. spheroidalis*, was published in the Ann. & Mag. Nat. Hist. ser. 5, vol. iv. 1879, p. 84, pl. ix. It will be noticed (p. 91) that there are canals and that the spicules are tetraclade. The figures given were drawn from nature by A. S. Foord, and figs. 1 and 2*b, e*, give exact representations of the tetraclade elements of the canals, which are also in part represented in fig. 4. Prof. Steinmann says that the canals and spicules do not exist, and it follows that if he is correct the author of the paper was romancing and the able artist was drawing from his imagination. The most charitable proceeding is to suppose that the professor has not seen the paper on *Hindia* and has not had the opportunity of examining the type, part of which is at Munich. It is perfectly proved by Dr. Rauff that the morphology of *Hindia* was correctly described, and it is not therefore necessary to pursue the

contest with Prof. Steinmann any further. But two points of considerable interest have been raised by Dr. Rauff and by my friend Dr. Hinde, who first of all brought the fossil under my notice.

Firstly, I called the species *Hindia sphaeroidalis*, and described it so that Dr. Rauff had no difficulty in recognizing the form; the morphology of the species and its special characters were also given by me (Ann. & Mag. Nat. Hist. ser. 5, vol. iv. p. 91). But Dr. Hinde, in the admirable 'Catalogue of Fossil Sponges in the British Museum,' p. 57, 1883, replaces my name "*sphaeroidalis*" by "*fibrosa*," and attributes the species to Ferd. Rømer. I demur to this proceeding, and for the following reasons:—It is a rule in classification that a species, in order to be established, must be so described that other forms than the type can be recognized. Subsequently, however, the generic name may be altered, and the species always remains with the describer's name attached. Now Ferd. Rømer, in his 'Silurian Fauna of W. Tennessee,' p. 20, described the form under consideration as *Calamopora fibrosa*, Goldf., and gave *Favosites fibrosa*, Lonsdale, as a synonym. He considered the form a coral, and I maintain that there is not a single sentence in the description, meagre as it is, that would lead any one to distinguish the form I described from New Brunswick as belonging to it. So far as my recollection carries me, I passed by Ferd. Rømer's description and figures as not relating to the fossil I was then studying. Ferd. Rømer not having properly and practically described the form he studied, and having placed it amongst the Corals, I do not consider his species of any value whatever.

I cannot agree therefore to have my specific name "*sphaeroidalis*" replaced by the unrecognizable and imperfectly-described "*fibrosa*." I therefore restore the name I gave to the sponge, and cannot recognize *H. fibrosa*, F. Rømer, sp. *Hindia sphaeroidalis*, Dunc., is quite correct.

The second point refers to the original mineralogical condition of the New Brunswick specimen, and which Dr. Rauff has examined at Munich. The present mineralization of the tetraclade spicules is calcareous. Dr. Hinde (*op. cit.* p. 58) writes:—"The examples from New Brunswick, however, have had their original skeleton replaced by calcite; and this fact led Prof. Duncan to believe that they were originally calcareous, so that 'there must have been a former mimetic and calcareous group of Spongida.'" The last part of the sentence is of course from my work.

It was not, however, the calcareous nature of the spicules

which alone led me to the expression of the belief in the original calcareous condition of the skeleton; it was the discovery of a penetrating, parasitic, unicellular, vegetable organism within the canals and traversing the spicules which led mainly to the belief. Dr. Rauff mentions this *Palwachlya*, and notices correctly that it influenced my opinion that the skeleton was not siliceous in the living state.

But whilst he came to satisfactory conclusions regarding Prof. Steinmann in a perfectly scientific manner, my fellow-labourer considered the *Palwachlya* a *quantité négligable*.

I venture to refer any body who may take an interest in this discussion to read the papers on the subject of the perforating parasitic Thallophytes recent and fossil (Proc. Royal Soc. 1876, no. 174, p. 238; and Quart. Journ. Geol. Soc. 1876, p. 205); also a communication to the Royal Microscopical Society, 1881, on the cavities within siliceous sponge-spicules, the result of vegetable organisms (Journ. Royal Microsc. Soc. ser. 2, vol. i. p. 557).

No long tubular vegetable structures with organs of reproduction have ever been found ramifying in siliceous skeletons, and the resemblance of the parasitic organisms of the Silurian, Devonian, and subsequent geological ages (found in calcareous fossils) to those in the shells of Mollusca, Corals, and Foraminifera of the present day is most remarkable. The penetrating Thallophytes of the present day belong to the same group as the ancient ones, and they are and were dependent upon the organic matter (connective tissue) which is within the calcareous structures of Mollusca, Corals, &c.

I maintain that the *Palwachlya* grew and lived in the sponge as it did in the corals of the same age, and that it was not introduced after fossilization. It was the presence of these tubular forms of many sizes within the calcareous element, as well as free in the canals of the *Hindia*, that made me believe the original skeleton was calcareous, not, as Dr. Hinde puts it, because the calcareous element now exists.

Fully appreciating Dr. Hinde's excellent work, and acknowledging the force of the arguments he has adduced to prove the occurrence of calcite after silica, I nevertheless must consider the argument I have brought forward to be of importance. Of course the statement that the mimetic series of calcareous sponges once existed, is within reasonable distance of the truth, for who amongst us is to limit Nature as regards possibilities? (Specimens of *Hindia sphaeroidalis*, nobis, are now in the British Museum, and are portions of the type.)